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ABSTRACT

Despite recent scholarly concern with "neighborhood effects" on children, no study to date has measured the cumulative exposure of children to poor and affluent neighborhoods. This study constructed multi-state life tables to estimate racial and ethnic differences in "childhood expectancy" in five neighborhood types, ranging from affluent to extreme poverty. At early 1990 rates, black children could expect to spend over 60 percent of their first 18 years in neighborhoods with poverty rates in excess of 20 percent. The corresponding figures for white and Hispanic children were about 14 and 36 percent, respectively. Given the fact that most black children do not reside in poor families, it is evident that a large proportion of the child-years spent in poor neighborhoods are spent by non-poor black children. White children could expect to live nearly five times longer than black children and 12 times longer than Hispanic children in neighborhoods with poverty rates of less than 3 percent. Results found less white/black inequality once neighborhood status at birth was taken into account, suggesting that racial differences in childhood exposure to neighborhood conditions were due primarily to differences in the probability of being born into a poor neighborhood. Recommends further research on the effects of different doses of exposure to neighborhood poverty and affluence. (Author/SM)

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Racial and Ethnic Inequality in Childhood Exposure to Neighborhood Poverty and Affluence*

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Racial and Ethnic Inequality in Childhood Exposure to Neighborhood Poverty and Affluence

Abstract

Despite recent scholarly concern with "neighborhood effects" on children, no study to date has measured the cumulative exposure of children to poor and affluent neighborhoods. I construct multi-state life tables to estimate racial and ethnic differences in "childhood expectancy" in five neighborhood types, ranging from affluent to extreme poverty. At early 1990s rates, Black children could expect to spend over 60 percent of their first 18 years in neighborhoods with poverty rates in excess of 20 percent. The corresponding figures for White and Hispanic children are about 14 and 36 percent, respectively. White children could expect to live nearly 5 times longer than Black children and 12 times longer than Hispanic children in neighborhoods with poverty rates of less than 3 percent. I found less White/Black inequality once neighborhood status at birth is taken into account, suggesting that racial differences in childhood exposure to neighborhood conditions are due primarily to differences in the probability of being born into a poor neighborhood. Although the share of childhood spent in affluent and extremely poor neighborhoods has changed substantially over time, there is no obvious trend in White/Black inequality in childhood expectancy in the collapsed "nonpoor" and "poor" categories.

Sociological inquiry into the effects of neighborhood characteristics on the behavior and life chances of individuals spans nearly the entire history of the discipline (Brace 1872; Riis 1890; Rowntree 1901; Addams 1909; Park and Burgess 1925; Shaw and McKay 1942; Drake and Cayton 1945; Clark 1965). More recently, William Julius Wilson is credited with rekindling sociologists' concern with "neighborhood effects" on children (e.g., Jencks and Mayer 1990, p. 111; Gephart 1997). In *The Truly Disadvantaged*, Wilson (1987) argues that a combination of urban industrial decline and the migration of middle class Blacks[1] out of inner city neighborhoods in the 1970s "resulted in a disproportionate concentration of the most disadvantaged segments of the urban Black population, creating a social milieu significantly different from the environment that existed in these communities several decades ago" (p. 58). According to Wilson, this milieu has disastrous effects on the successful socialization of children. In very poor neighborhoods, Wilson argues,

> the chances are overwhelming that children will seldom interact on a sustained basis with people who are employed or with families that have a steady breadwinner. The net effect is that joblessness, as a way of life, takes on a different social meaning; the relationship between schooling and postschool employment takes on a different meaning. The development of cognitive, linguistic, and other educational and job-related skills necessary for the world of work in the mainstream economy is thereby adversely affected... A vicious cycle is perpetuated through the family, through the community, and through the schools (p. 57).

In short, Wilson hypothesizes that children who grow up in poor neighborhoods experience more negative outcomes in school and in the labor market than otherwise equivalent children who grow up in nonpoor neighborhoods. This hypothesis prompted a flurry of inquiry

[1] In this paper I use the terms "White," "Black" and "Hispanic" to refer to children who were identified on the PSID as non-Hispanic White, non-Hispanic Black, and Hispanic, respectively. I follow Rubinowitz and Rosenbaum (2000) in capitalizing "White" and "Black," to emphasize that, like Asians and Hispanics, Blacks and Whites in America share salient ethnic and cultural similarities.

into the effects of neighborhood context on child well-being.[2] Among the many outcomes that have been studied are school achievement (Crane 1991; Brooks-Gunn et al. 1993; Connell and Halpern-Felsher 1997), teenage fertility (Brooks-Gunn et al. 1993; Sucoff and Upchurch 1998; South and Baumer 2000), and delinquency (Sampson 1997; Bellair and Roscigno 2000; Duncan, Boisjoly, and Harris 2001). Other scholars have focused attention on the difficulties Black middle class parents face in raising children in poorer neighborhoods than those occupied by White middle class families (Anderson 1999; Furstenberg et al. 1999; Pattillo-McCoy 1999).

As a result of this valuable research we now know much about the *effects* of childhood exposure to neighborhood poverty. However, and perhaps somewhat surprisingly, we know little about the *duration* of children's exposure to neighborhood poverty. Focusing on duration is important because if neighborhoods indeed have effects on children, it is likely that these effects accumulate over time. That is, a one-year "dose" of exposure to a neighborhood's conditions should have less of an effect on child outcomes than a ten-year dose. To date, we simply don't know the extent to which children cycled in and out of poor neighborhoods in the 1970s and 1980s. Focusing on childhood is important because there are sound theoretical reasons to suspect that neighborhoods have powerful influences on children's life chances. Childhood and adolescence are crucial periods in which life trajectories are shaped via the influences of peer relationships, formal schooling, and early labor market experiences. Children are overwhelmingly exposed to these influences in their local neighborhood. By contrast, theory is less well developed on how residence in a poor or affluent neighborhood might affect adult outcomes, in part because adults tend to be much more geographically footloose in the course of daily activities.

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[2] See Jencks and Mayer (1990), Furstenberg and Hughes (1997), Gephart (1997), and Sampson, Morenoff, and Gannon-Rowley (forthcoming) for thorough reviews of this literature.

Cross-sectional data show that extremely poor neighborhoods are predominantly populated by Blacks (Jargowsky 1997, pp. 39, 62; Table 1 below). Under stable population conditions, cross-sectional data yield accurate estimates of life expectancy in given states (Preston and Campbell 1993). However, much research has shown that the proportion of the population living in poor neighborhoods changed rapidly from 1970 to 1990 (Jargowsky and Bane 1991; Jargowsky 1994, 1997; Massey 1996). Thus, cross-sectional data are unlikely to provide adequate indicators of racial and ethnic inequality in children's exposure to neighborhood poverty and affluence throughout childhood. In this paper I use longitudinal data and multi-state life table techniques to investigate the extent of racial and ethnic inequality in the proportion of childhood spent in affluent and low, moderate, high, and extreme poverty neighborhoods.

The goals of this paper are threefold. I first compare "childhood expectancy"[3] across neighborhoods between Whites, Blacks, and Hispanics. These analyses provide a baseline measure of racial and ethnic inequality in childhood exposure to neighborhood context. I then compare White and Black childhood expectancy by neighborhood status at birth. The results of this analysis indicate the extent to which aggregate racial inequality is caused by differential exposure at birth to neighborhood poverty, and the extent to which it is caused by racial differences in rates of upward and downward neighborhood mobility. Finally, I examine the extent to which White/Black inequality has changed over time. In so doing I estimate the effects of increasing residential segregation by income (Jargowsky 1996), and particularly the increasing prevalence of neighborhood poverty for Blacks (Wilson 1987; Jargowsky 1997), on trends in racial inequality in childhood exposure to neighborhood context.

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[3] This term is analogous to life expectancy in standard mortality life tables. It denotes the percentage of childhood (age 0 to 18) the average child would be expected to spend in a given neighborhood type (Heuveline, Timberlake, and Furstenberg 2000).

Racial and Ethnic Inequality in Neighborhood Context

An extensive social science literature, reporting results from analyses of numerous data sources, has clearly demonstrated two facts about racial differences in neighborhood context. First, Blacks and Hispanics tend to live in neighborhoods with higher levels of physical and social problems than those occupied by otherwise comparable Whites (Alba and Logan 1991, 1993; Logan and Alba 1993; Alba, Logan, and Bellair 1994; Rosenbaum 1994, Logan, Alba, and Leung 1996; Logan et al. 1996; Logan and Stults 1999; Rosenbaum et al. 1999; Sampson et al. 1999; Alba, Logan, and Stults 2000; White and Sassler 2000; Rosenbaum and Friedman 2001). Second, in a given period ethnic minorities are less likely than Whites to move at all (South and Deane 1993; Crowder 1997, 2001; South and Crowder 1998a), less likely to transition from poor to nonpoor neighborhoods, and more likely to transition from nonpoor to poor neighborhoods (Gramlich, Laren, and Sealand 1992; Massey, Gross, and Shibuya 1994; Quillian 1997; South and Crowder 1997, 1998a).

Few studies to date bear directly on the question of racial differences in the duration of childhood exposure to neighborhood poverty. St. John and Miller (1995) use 1980 and 1990 census data from Chicago and five southwestern cities to compare the proportions of Black, White, and Latino children residing in neighborhoods with poverty rates greater than 40 percent. They find that in 1990 Black children were 7 to 48 times more likely to live in very poor neighborhoods in the Southwest, and over 91 times more likely in Chicago. Rosenbaum and Friedman (2001) find that among households with children in New York City, native-born Black households are located in neighborhoods with significantly higher levels of juvenile delinquency,

teenage fertility, and AFDC receipt, and lower levels of math achievement in school. However, neither of these studies investigates total childhood durations of exposure to poor neighborhoods.

Much more closely related to the present study are analyses performed by South and Crowder (1998a) and Quillian (1997, p. 72-103). South and Crowder use geocoded PSID data to estimate transition probabilities for Black and White single mother-headed households with children. They find that Black single mothers are less likely than White single mothers to move from poor to nonpoor neighborhoods and more likely to move from nonpoor to poor neighborhoods, controlling for household SES and life course characteristics. Quillian uses geocoded PSID data to estimate the length of spells experienced by Black heads of household in three neighborhood types: nonpoor (fewer than 20% of residents in poverty), poor (between 20% and 40% poor), and very poor (greater than 40% poor). He finds that just over 37 percent of all spells in very poor neighborhoods are expected to last less than 5 years, with another 15 percent lasting between 6 and 10 years. Over 47 percent of all spells in very poor neighborhoods last longer than 10 years, with fully one-fourth of all spells lasting longer than 20 years. Even more striking are his estimates of spell lengths in nonpcor neighborhoods. Nearly one-half of all spells in nonpoor neighborhoods lasted for one year or less, with more than three-fourths of all spells lasting less than five years. Only a little more than 5 percent of all spells in nonpoor neighborhoods lasted longer than 20 years.

The multi-state life table approach I use in this paper complements Quillian's "spells" approach. This latter technique is useful for estimating the prevalence of transitory and chronic membership in a given neighborhood type. However, even children who only spend a short period of time in a poor neighborhood during any given spell might experience multiple spells of varying lengths. Thus, knowing that a large proportion of spells in poor neighborhoods are relatively short

yields only indirect information about time spent in poor neighborhoods throughout childhood. The advantage of the multi-state life table approach I employ is that it records the cumulative amount of time children are expected to spend in a particular type of neighborhood.

Data

Panel Study of Income Dynamics

The primary source of data for this research is the Panel Study of Income Dynamics, waves 1970 through 1993. The PSID was first administered in 1968 to 4,800 families (comprising about 16,500 individuals), and then yearly thereafter. At the time it was first fielded the PSID was representative of noninstitutionalized U.S. residents and their families (PSID 1987). As children left the households of the original sample, they were followed and interviewed along with their new family members. By 1993 the PSID comprised over 28,000 individuals, nested within some 9,500 households. The representativeness of the sample has been maintained over time, despite some attrition (Fitzgerald, Gottschalk, and Moffitt 1998). In 1990 the PSID drew a supplementary sample of about 1,700 Hispanic families; thus, I am able to perform single-period comparisons between Whites, Blacks, and Hispanics. Because the original PSID panel contains few Hispanic families, however, I must restrict single-period analyses by neighborhood status at birth and cross-period analyses to families with Black or White heads of household. In addition, I restrict analyses to children living in metropolitan areas (MAs).[4]

[4] In 1992 the census Bureau defined MAs as places with a minimum population of 50,000 or a Bureau-defined urbanized area and a total population of at least 100,000 (75,000 in New England). MAs comprise one or more central counties, and may include outlying counties that have close economic and social relationships with the central county. In New England MAs are composed of cities and towns rather than whole counties (U.S. Bureau of the Census 1992b).

In the early 1990s, the University of Michigan's Institute for Social Research (ISR) released the 1970 and 1980 Geocode Match Files (GMFs), which enabled researchers to append tract-level information from the 1970 and 1980 U.S. census to PSID data. Unfortunately, these files did not contain addresses for 1969, 1975, 1977, 1978, or any year after 1985. Thus, much research on racial differences in residential mobility has been limited to analyzing data from the years 1979 to 1985 (Gramlich 1992; Crowder 1997, 2001; Quillian 1997, 1999; South and Crowder 1997, 1998a, 1998b). This restricted time frame has hamstrung researchers' ability to exploit fully the potential of geocoded PSID data for understanding racial inequality in neighborhood context over time. The recently-released 1990 GMF contains addresses for 1986 to 1993. In addition, while preparing the 1990 file, ISR staff found address files for 1975, 1977, and 1978 in a bank safe deposit box (Kim and Padot 1999, p. 5). Thus, in this research I am able to analyze an uninterrupted series of data from 1970 to 1993.

U.S. Census Data

I use the 1990 GMF to link PSID data with summary tape file data from the 1970 through 1990 U.S. censuses (U.S. Bureau of the Census 1972, 1982a, 1992a). These files contain information on population and housing for states and their subareas in hierarchical sequence down to the block group level. The addition of census data to the PSID results in a singular source of data on household-level variables such as family structure and SES, and information about the neighborhoods in which families live, measured by proxy with census tracts.[5]

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[5] The census Bureau defines census tracts as "small, relatively permanent statistical subdivisions of a county... [with] between 2,500 and 8,000 persons and, when first delineated, are designed to be homogeneous with respect to population characteristics, economic status, and living conditions" (U.S. Bureau of the Census 1992b, appendix A). While tracts may not perfectly replicate the subjective definitions citizens have of their "neighborhoods" (Lee and Campbell 1997), many researchers have used tracts as the best available proxy (e.g., White 1987; Jargowsky 1997; South and Crowder 1997; Quillian 1999). Moreover, if subjective deviations are distributed randomly across individuals there would be no bias in measures of "neighborhood" characteristics (see Sampson et al. 1999).

Problems of Intercensal Comparability

Tract level. The PSID tracks whether respondents moved between yearly interviews. In addition, the 1990 GMF records the state, county, and census tract each respondent lives in at the time of the yearly interview. However, some tracts on the 1990 GMF did not exist in 1980 or 1970, since many tracts changed boundaries from 1970 to 1990. I use the census Bureau's 1970 to 1980 and 1980 to 1990 tract match files (U.S. Census Bureau 1982b, 1992c) to convert all 1980 and 1990 tract codes on both the 1990 GMF and the 1980 and 1990 census files to their 1990 equivalents. In addition, whereas PSID respondents are surveyed every year, tract information is only measured at three time points. Therefore, I impute 1971 to 1993 intercensal (and extracensal) tract values via exponential interpolation and extrapolation, using 1970 through 1990 census data.[6] I then match tracts on the census data files to tracts on the GMF, resulting in a data file that contains PSID variables on families and individuals and census data on tracts, counties, and MAs, for the 1970 to 1993 period. The procedures used to create the "Geographic PSID File" are summarized in Figure 1.

(Figure 1 about here)

[6] For this procedure I assume a constant population growth rate r_i between each pair of censuses (Preston et al. 2001). I estimate tract characteristic X in inter- or extracensal year t with the following formula:

$$X_t = X_{t-n}e^{r_i n} \quad (1)$$

where, for $(t - n) < 1980$,

$$r_1 = \frac{1}{10}\ln\left(\frac{X_{1980}}{X_{1970}}\right), \quad (2)$$

and for $(t - n) > 1980$,

$$r_2 = \frac{1}{10}\ln\left(\frac{X_{1990}}{X_{1980}}\right).$$

Metropolitan area level. Just as tract boundaries shift over time, MA definitions occasionally change between censuses for one or more of three reasons: (1) new counties are added to MA definitions because of newly-recognized economic or social relationships between those counties and the central county; (2) MAs lose one or more counties if a city within one of those counties gains enough population over time to become defined as its own MA; or (3) a MA loses one or more counties to another contiguous MA, as the economic relationship of a county becomes more linked to one MA versus another.[7] In this paper I use the most liberal definition of MAs by defining them in 1970 and 1980 on the basis of their constituent counties in 1990.[8]

Multi-state Life Tables

Life tables are a general class of models that describe the transition over time of a cohort of individuals from one state to another. In its most classic form, a mortality life table describes the dying out of a birth cohort. However, life tables can be extended to other situations to describe "exits" or "decrements" from one life state to another, such as from single to married status. In this example, a multiple decrement life table is used to account for the competing risks of marriage and death for members of a birth cohort (Preston et al. 2001). The multi-state (or increment-decrement) life table is an extension of these methods in that (1) individuals don't necessarily transition from one state to another (i.e., there may be no "decrements" for some individuals); and (2) some destination states are non-absorbing; that is, flows to (increments) and from (decrements) various states are possible (Palloni 2001, p. 256).

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[7] For instance, Monroe County in Southeastern Michigan was part of the Toledo MA in 1980 but by 1990 had shifted to the Detroit MA.

[8] Burr, Galle, and Fossett (1990, p. 263) conclude that at least in the area of occupational inequality, "the change in census Bureau SMSA definitions does not have critical effects on substantive analyses." In their analysis, the within-census correlations between the decade-specific and fixed definitions of MAs all exceed 0.93 from 1940 to 1960.

State Space

The multi-state approach begins with defining the state space, or the mutually exclusive and exhaustive set of values of the categorical dependent variable of interest. Jargowsky and Bane (1991) developed a neighborhood ranking system in which neighborhoods with less than 20 percent of residents in poverty are considered "nonpoor," those with 20 to 40 percent poverty are considered "poor," and those with greater than 40 percent poverty are considered "extremely poor." The authors confirmed the validity of these rankings by visiting neighborhoods in a number of cities, finding that neighborhoods in poorer categories appeared more distressed on a number of subjective indicators. Local census officials confirmed these subjective rankings (Jargowsky and Bane 1991).

I extend the work of Jargowsky and Bane by defining three "nonpoor" neighborhood types: "affluent" neighborhoods have 3 percent or less of their residents in poverty, "low poverty" neighborhoods are those with poverty rates of between 3 percent and 10 percent, and "moderate poverty" neighborhoods are defined as having 10 to 20 percent of their residents in poverty of their residents in poverty. I also define two "poor" neighborhood types: "high poverty" neighborhoods have between 20 percent and 40 percent poverty, and "extreme poverty" neighborhoods feature poverty rates in excess of 40 percent.[9] Although these five states obviously don't capture all of the variation in neighborhood conditions, many researchers have used similar categories as proxies for neighborhood "types" (e.g., Jargowsky 1997; South and Crowder 1997, Quillian 1997, 1999).

Life Table Estimation

[9] The collapsed "poor" and "nonpoor" categories match those of previous research (e.g., Quillian 1997; South and Crowder 1997). I also define one state for children who are censored, either because they entered the sample after

There are two principal methods to construct a multi-state life table, one based on rates of transition (Palloni 2001), and another based on probabilities of transition (Heuveline et al. 2000) between states. With repeated cross-sectional data, transitions are not directly observed, so researchers must use the former, more cumbersome method. With panel data, however, survivorship ratios can be estimated directly as:

$$\frac{{}_{n}^{i}N_{x}^{j}(t)}{{}_{n}N_{x-n}^{i}(t-n)} = \frac{{}_{n}^{i}L_{x}^{j}[t-n,t]}{{}_{n}L_{x-n}^{i}[t-n,t]}, \tag{3}$$

where

${}_{n}N_{x-n}^{i}(t-n)$ = the number of children aged x - n to x and in state i at time t - n;

${}_{n}^{i}N_{x}^{j}(t)$ = the number of children aged x to x + n and in state j at time t who were in state i at time t - n;

${}_{n}L_{x-n}^{i}[t-n,t]$ = the number of child-years lived in state i, between age x - n and x in the period $[t$ - $n,t]$;

${}_{n}^{i}L_{x}^{j}[t-n,t]$ = the number of child-years lived in state j, between age x - n and x in the period $[t$ - $n,t]$ by children who were in state i at time t - n; and

i and j = any state unless i is the absorbing state (LFU), in which case $j = i$.

Using the Geographic PSID File (see Figure 1), I reconstruct the neighborhoods in which children lived yearly (i.e., $n = 1$) from birth to age 18 and calculate the quantities ${}_{1}N_{x-1}^{i}(t-1)$ and ${}_{1}^{i}N_{x}^{j}(t)$ at any time t before the survey. I then obtain the distribution of child years lived across

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birth (left-censored), or they were temporarily or permanently (right-censored) "lost to follow-up" (LFU), either due to death or attrition.

states between ages x and $x + 1$ from the same distribution between ages $x - 1$ and x using equation (3) above and the following accounting identity:

$$ {}_1L_x^j[t-1,t] = \sum_{i=1}^{I} {}_1L_x^i[t-1,t]. \tag{4} $$

With the resulting period life tables, I estimate childhood expectancies in the five neighborhood states by racial and ethnic group, neighborhood status at birth, and synthetic birth cohort. [10]

Limitations

The individual-level independent variable in this analysis is the racial or ethnic identity of the child. For describing gross racial and ethnic inequality in childhood expectancy in different neighborhood types within metropolitan areas, the multi-state life table analysis I perform is adequate. However, this approach makes the simplifying Markovian assumption that all individuals within a given life table share the same underlying probabilities of transitioning from one neighborhood type to another. As Quillian (1997, p. 76) notes, "this assumption is convenient, but surely incorrect." Indeed, models of racial differences in neighborhood context contend that characteristics of households affect the chances that families will transition from certain types of neighborhoods to others (Alba and Logan 1991). Future research should strive to estimate the effects of household- and metropolitan area-level variables on racial and ethnic differences in childhood exposure to neighborhood poverty and affluence.

[10] In contrast to cohort life tables, which simply record what happens to a birth cohort as it ages, period life tables estimate what *would* happen to a birth cohort if it were to experience, in this case, the age-specific neighborhood transition probabilities that exist during the period in which the birth cohort is defined, e.g., January 1, 1990 to December 31, 1993. Because the future experiences of such cohorts are not observed, but rather estimated with period conditions, demographers refer to them as "synthetic" birth cohorts (Preston et al. 2001, p. 42).

Results

Cross-sectional Results

Table 1 presents distributions of neighborhood types and distributions of Whites, Blacks, and Hispanics across those types in 1970, 1980, and 1990. The percentage of affluent tracts declined sharply from 1970 to 1980 and then rebounded in 1990, while the proportion of extremely poor tracts increased slightly from 1970 to 1980, and then more rapidly from 1980 to 1990. These figures are consistent with prior research showing increasing economic residential segregation during the 1970s and 1980s (e.g., Jargowsky 1996). Similar patterns can be observed with respect to the distribution of Blacks and Whites across neighborhood types, with several notable exceptions. First, the percentage of Blacks living in affluent neighborhoods nearly doubled from 1980 to 1990, whereas the share of affluent tracts increased more slowly—about 40 percent—during the same period. Second, while the percentage of extremely poor tracts increased by less then 30 percent from 1970 to 1980, the percentage of Blacks living in such neighborhoods increased by nearly 77 percent.

These findings reflect prior research showing that the concentration of Black poverty increased dramatically during the 1970s (Massey and Eggers 1990), and that affluent Blacks were increasingly able to put distance between themselves and the Black poor during the 1980s (Jargowsky 1996). Finally, note that whereas the distribution of White children is nearly identical to that of all Whites, Black children are underrepresented in nonpoor neighborhoods, and overrepresented in poor neighborhoods, compared to all Blacks. This suggests that racial inequality in childhood exposure to neighborhood poverty and affluence may be especially great among children.

(Table 1 about here)

What do the cross-sectional results in Table 1 tell us about total childhood exposure to neighborhood poverty and affluence? In general, cross-sectional data cannot shed light on what happens to individuals and families as they progress through time. As Gramlich et al. (1992, p. 274) note, "...it remains unclear whether the poor people living in poor urban areas are... the same poor people who lived in the same areas at some earlier date." Under certain demographic conditions, however, cross-sectional data would yield accurate information about life expectancies in given states. Demographers refer to populations as being "stable" when the following conditions prevail over a long period of time: (1) constant or constantly changing age-specific fertility rates; (2) constant age-specific mortality rates; and (3) net migration rates of zero at all ages (Preston et al. 2001, p. 53). Under these conditions, life expectancy at any age equals the fraction of the population at that age. In the multi-state framework, if rates of transition to and from the different states remain constant for a sufficient period of time, then life expectancy in a given state would equal the cross-sectional distribution of the population in those states. Under the assumptions of the stable population model, therefore, we should find that Black childhood expectancy in extremely poor neighborhoods for 1990 should be roughly 18 percent of childhood (see Table 1, bottom right-most cell). Similarly, White childhood expectancy in affluent neighborhoods should equal about 10 percent of childhood. To see whether a longitudinal approach differs from the cross-sectional picture, I present results from multi-state life table analyses in the next section.

Racial and Ethnic Differences in Childhood Expectancy Across Neighborhood Types

All birth statuses. Table 2 and Figures 2 and 3 present childhood expectancies in the five neighborhood types, for a synthetic birth cohort estimated for the 1990 to 1993 period. Figure 2 and the top row of Table 1 pertain to all neighborhood types at birth. Figure 3 and rows 2 and 3 of Table 1 break the findings down by neighborhood status at birth. Because the original PSID panel contained few Hispanic families, I cannot observe the birth status for Hispanic children born from 1973 to 1989, which is necessary for the latter analysis.

(Table 2 about here)

At early 1990s rates, Black children born between 1990 and 1993 in metropolitan areas could expect to spend over 60 percent of their childhoods in neighborhoods with poverty rates in excess of 20 percent (the sum of the top two sections in the right-hand bar in Figure 2). The corresponding figures for White and Hispanic children are about 14 and 36 percent, respectively. Note that although childhood expectancy in "high poverty" neighborhoods (20% to 40% poor) is nearly identical for Blacks and Hispanics (about 30% of childhood), Hispanic children could expect to spend much less time in extremely poor neighborhoods than Black children (7.6% vs. 33.4%, respectively). Similarly, White children could expect to live nearly 5 times longer in neighborhoods with less than 3 percent poverty than Black children (31.1% vs. 6.7%). Childhood expectancy in affluent neighborhoods for Hispanic children is 1/12 that of White and 2/5 that of Black children. On average, White children can expect to spend over 85 percent of their childhoods in nonpoor neighborhoods (affluent and low and moderate poverty types), whereas this childhood expectancy is 64 percent for Hispanic children and 37 percent for Black children.

(Figure 2 about here)

The results of this analysis indicate that White children are overwhelmingly advantaged with respect to Hispanic and especially Black children in terms of childhood expectancy in affluent and extremely poor neighborhoods. Consistent with their status as "intermediate" minorities in the American racial stratification system (e.g., Zubrinsky and Bobo 1996), Hispanic children could expect to spend very little time in either of the two extreme neighborhood types. Rather, childhood expectancies for Hispanic children were concentrated in the three middle categories, with each accounting for about 30 percent of childhood. Thus, although Hispanic children could expect to spend less time than Black children in affluent neighborhoods, and about the same amount of time in high poverty neighborhoods, Hispanic children could expect to spend much less time in extremely poor neighborhoods, and much more time in low poverty neighborhoods.

These results also indicate that the cross-sectional findings do not correspond particularly well to the period life table findings. Under the stable population model, we would have expected Black children to spend about 18% of childhood in extremely poor neighborhoods. The findings in Table 1 and Figure 2 indicate that, at early 1990s rates, Black children could expect to spend nearly twice that long (33.4% of childhood) in such neighborhoods. Similarly, if the U.S. population were truly stable with respect to rates of transition into and out of neighborhood types, we would expect White children to spend about 10 percent of childhood in affluent neighborhoods. The period life table results suggest that in the early 1990s White children could expect to spend three times that long in such neighborhoods.

Results by neighborhood status at birth. The bottom two rows of Table 2 and Figure 3 present results for Black and White children, by neighborhood status at birth (poor and nonpoor). These results indicate the extent to which Black and White children are "trapped" in poor neighborhoods (or reside continuously in nonpoor neighborhoods) from birth.

For children born in poor neighborhoods, White childhood expectancy in such neighborhoods is less than 10 percent lower than that for Black children, or a White:Black ratio of 0.88. For all birth statuses, White childhood expectancy in poor neighborhoods was only 23 percent that of Black childhood expectancy. However, of the 80 percent of childhood Black children born in poor neighborhoods could expect to spend in such neighborhoods, more than half of this expectancy was in extremely poor neighborhoods (about 47%). By contrast, White children born in poor neighborhoods could expect to spend only about 18 percent of childhood in the poorest neighborhood type.

Similarly, for children born in nonpoor neighborhoods the White:Black ratio of childhood expectancy in nonpoor neighborhoods was about 1.34. For all birth statuses, the equivalent ratio is 2.31. Whereas White children born to all birth statuses could expect to spend nearly five times longer in the most affluent neighborhood type than Black children, this ratio drops to a little over two for children born in nonpoor neighborhoods. Although Black children born in nonpoor neighborhoods could expect to spend only about 5 percent of childhood in the poorest neighborhood type (compared to 33% for all birth statuses), White children's exposure to such neighborhoods was virtually zero (about five one hundredths of a person-year, the equivalent of about 17 person-days).

Thus, as of the early 1990s there was a great deal of racial inequality in childhood exposure to neighborhood poverty and affluence. Although inequality persists even when

controlling for neighborhood status at birth, racial differences in childhood expectancy appear to be driven largely by the chances of being born in a nonpoor or poor neighborhood. Put differently, Black children born in nonpoor neighborhoods don't appear to suffer dramatically higher rates of downward neighborhood mobility than equivalent White children. However, given that White children are nearly three times more likely than Black children to be born into nonpoor neighborhoods (91% of White children and 34% of Black), aggregate racial differences in childhood expectancy remain high.

One way to gauge the effect of neighborhood status at birth is to ask what Black childhood expectancies in different neighborhood types would be if Black children were as likely as White children to be born into nonpoor neighborhoods. Since the top row of Table 2 is essentially a weighted average of the bottom two rows, where the weights are the proportions of Black and White children born into nonpoor and poor neighborhoods, I re-estimated the unconditional distribution of childhood expectancies for Black children using White neighborhood birth status probabilities. I found that about 62 percent of the total racial difference in childhood expectancy across neighborhood types is due to racial differences in the distribution of neighborhood birth statuses. The remainder, or 38 percent, reflects higher rates of upward neighborhood mobility for White children and higher rates of downward neighborhood mobility for Black children.

(Figure 3 about here)

The results I have presented thus far pertain only to synthetic birth cohorts defined as of the early 1990s. It is conceivable that racial differences observed at this time are unique, since the early 1990s occurred at the end of an economic recession, and preceded the economic boom of

the mid- to late-1990s. Unfortunately, I cannot compare these results with more recent trends; however, in the following section I examine whether racial inequality was increasing from the early 1970s to the early 1990s. This period has been extensively studied by researchers because of changes in the concentration of Black poverty and within-racial group economic segregation during those two decades (Wilson 1987; Jargowsky 1996).

Changes in Racial Inequality over Time

To see how racial inequality in childhood exposure to neighborhood poverty and affluence has changed over time, I calculated three-year moving averages of childhood expectancies in the five neighborhood types from 1971 to 1993. Results for Whites appear in Figure 4, and Figure 5 presents results for Blacks, and Figure 6 presents racial differences (White minus Black) in childhood expectancy in nonpoor (affluent and low poverty types) and poor (moderate, high, and extreme poverty types) neighborhoods.

The findings suggest that for the most part, racial inequality in neighborhood context has remained relatively stable over time (see Figure 6), with several exceptions. First, White childhood expectancy in affluent neighborhoods increased rapidly from the late 1980s to the early 1990s, likely reflecting both increasing income bifurcation among wealthy Whites (Farley 1996) and increasing economic segregation among Whites during the 1980s (Jargowsky 1996). Second, although Black childhood expectancy in high and extreme poverty neighborhood remained relatively constant over time, hovering between 60 and 70 percent (the sum of the top two sections in Figure 5), the share of childhood expectancy in extremely poor neighborhoods increased dramatically over time. For the 1971 to 1973 period, I estimate that Black childhood expectancy in extremely poor neighborhoods was only about 10 percent of childhood (or less than two years). By the 1991 to 1993 period, that figure had ballooned to nearly 40 percent of

childhood (or 7.2 years). These figures indicate that the burden of childrearing for metropolitan area Blacks has increasingly shifted from doing so in poor neighborhoods to extremely poor neighborhoods. They also indicate that, whatever the benefits to growing up in affluent neighborhoods may be, White children increasingly benefited from exposure to such neighborhoods from the early 1980s to the early 1990s.

(Figure 4 about here)

(Figure 5 about here)

(Figure 6 about here)

Conclusion

In this paper I estimated racial differences in the duration of childhood exposure to neighborhood poverty and affluence. I found that, at early 1990s rates, Black children could expect to spend a much larger share of childhood in extremely poor neighborhoods than Hispanic and White children. Conversely, White children on average could expect to spend the lion's share of childhood in affluent and low poverty neighborhoods. Although childhood expectancy for Blacks in affluent neighborhoods was slightly larger than that for Hispanics, Hispanic children could expect to spend nearly twice as much time as Black children in the three "nonpoor" neighborhood types. Conditioning on neighborhood status at birth, I found less White/Black inequality, suggesting that a major cause of racial differences in childhood exposure to neighborhood poverty is Black children's higher likelihood of being born into poor neighborhoods. Over time, there has

been some shifting of childhood expectancy from high poverty to extreme poverty for Black children, and from low poverty to affluent for White children. However, for the most part racial inequality in childhood expectancy in "nonpoor" (< 20% poverty) and "poor" (> 20% poverty) neighborhoods has remained relatively stable over the past three decades.

There are at least three implications of this study for research on neighborhood effects on children. First, more research is needed to determine the effects of different "doses" of exposure to neighborhood poverty and affluence, and whether these effects vary by stage in child development. For example, does two years in a poor neighborhood matter more, less, or the same from age 0 to 2 than from age 14 to 16? Increasing scholarly focus on durations of exposure to neighborhood conditions has become all the more imperative in light of recent evidence on the effects of long-term exposure to poor neighborhoods on child outcomes. Two recent studies using cross-sectional data (Furstenberg et al. 1999; Duncan et al. 2001) found few and small effects of neighborhood context on adolescent outcomes. However, other evidence suggests that long-term residence exposure to neighborhood contexts has substantial effects on child outcomes (Rubinowitz and Rosenbaum 2000; Furstenberg 2001). Thus, the accretion of experiences growing up in particular kinds of neighborhoods likely has effects on outcomes in later adolescence and young adulthood that are not detectable either in the cross-section or at younger ages. Research must continue to identify the specific mechanisms by which neighborhoods affect the life chances of children (see Sampson et al. forthcoming); however, what is apparent from the present study is that whatever "dose" effects residence in poor and nonpoor neighborhoods have, Black children, and to a lesser extent Hispanic children, face massive disadvantages compared to White children.

Second, given the fact that most Black children do not reside in poor families (Patterson 1998), it is evident that a large proportion of the child-years spent in poor neighborhoods are being spent by nonpoor Black children. Ethnographic evidence has shown that Black middle class teenagers face profoundly different neighborhood environments than their White counterparts (Anderson 1999; Pattillo-McCoy 1999). This evidence and the present study should serve to inform debates about the causes of Black middle class children's continued poorer performance in school and in the labor market compared with their White middle class peers.

Finally, the results of this research suggest that the primary cause of racial differences in childhood expectancy in poor and affluent neighborhoods is neighborhood birth status, and not dramatically higher rates of upward neighborhood mobility for Whites and of downward neighborhood mobility for Blacks. In other words, at early 1990s rates, Black children born nonpoor neighborhoods could expect to spend over 70 percent of childhood in nonpoor neighborhoods (see Table 2 and Figure 3). This is consistent with recent evidence from housing mobility programs, which shows that once poor Black families from public housing projects are placed in nonpoor neighborhoods, they are overwhelmingly likely to remain in nonpoor neighborhoods 10 to 15 years later (Keels, Duncan, and Rosenbaum 2002).

Thus, the accretion of history has resulted in Black children's much greater likelihood of starting out life in poor neighborhoods. Racial differences in neighborhood birth status are likely caused by two proximate factors: higher poverty rates among Black families, and continuing high levels of residential segregation. Massey and colleagues have shown that the combination of these two forces has produced extremely high levels of poverty concentration for Blacks (Massey 1990; Massey and Eggers 1990; Massey et al. 1994; Massey and Fischer 2000). I conclude that in order for racial inequality in childhood exposure to neighborhood poverty to diminish substantially, the

probability of birth into a nonpoor neighborhood for Black children will need to be increased. Thus, public policy should be directed both at improving the conditions of neighborhoods where Blacks currently live, through increased investment in education and employment opportunities, and at reducing persistently high levels of racial residential segregation.

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FIGURE 1
Procedures for Merging 1970 to 1993 PSID Data with 1970 to 1990 U.S. Census Data

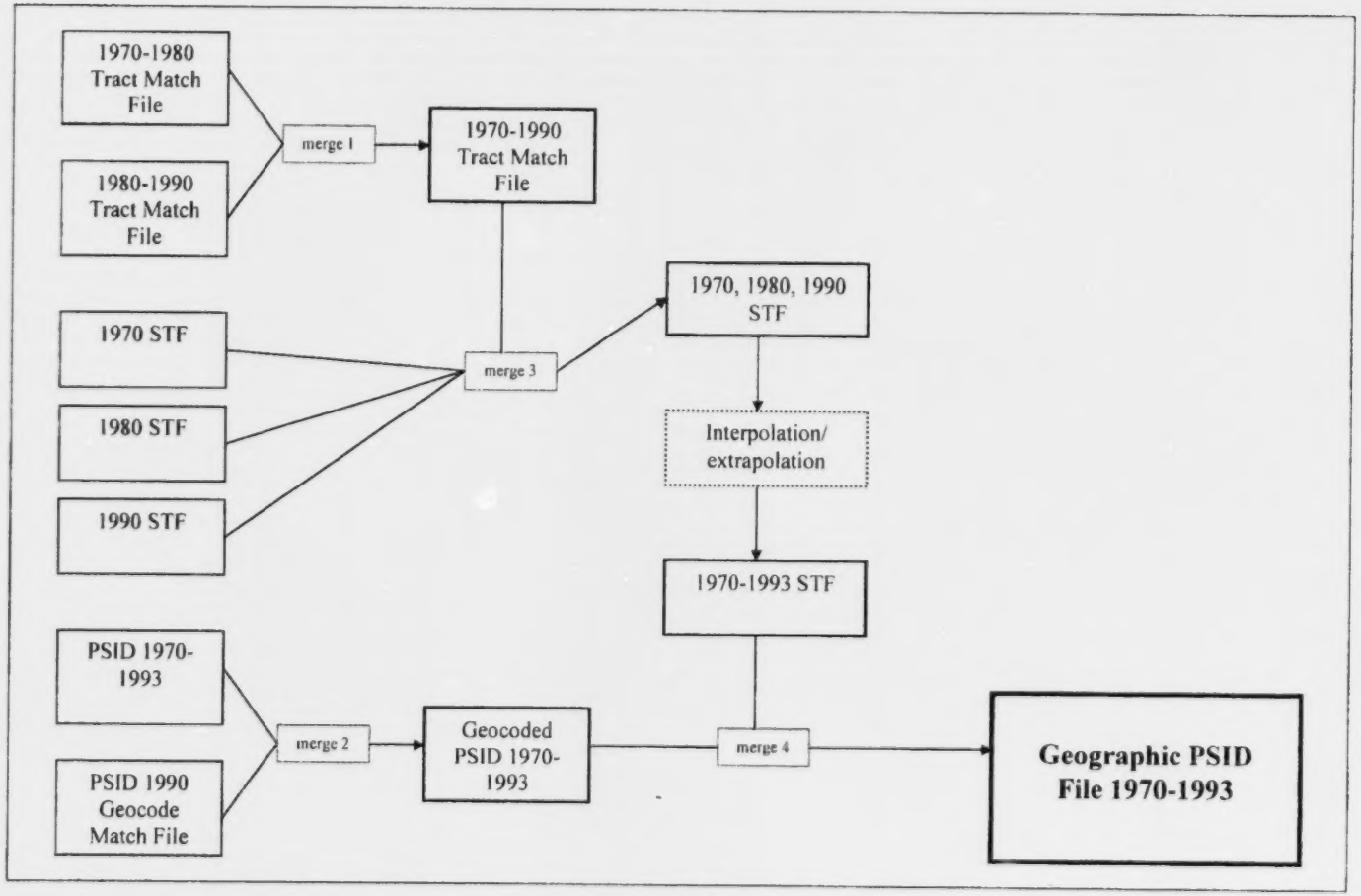


TABLE 1

Distributions of Neighborhood Types and White, Black, and Hispanic Populations in Each Type
U.S. Metropolitan Areas, 1970 to 1990

	Affluent (< 3% poverty)			Low poverty (3 to 10%)			Moderate poverty (10% to 20%)			High poverty (20% to 40%)			Extreme poverty (> 40%)		
	1970	1980	1990	1970	1980	1990	1970	1980	1990	1970	1980	1990	1970	1980	1990
Tracts															
Number	4,823	2,566	3,995	18,468	20,823	21,235	5,156	9,372	9,940	2,739	5,741	6,873	1,132	1,807	3,449
% of total	14.9	6.4	8.8	57.1	51.7	46.7	16.0	23.3	21.8	8.5	14.2	15.1	3.5	4.5	7.6
% of total population[a]															
White	15.3	6.1	9.4	67.5	64.4	58.8	12.6	21.6	21.7	4.0	7.0	8.7	0.7	0.8	1.4
Black	2.1	1.3	2.5	21.2	18.2	22.9	31.4	27.0	24.9	37.4	39.7	34.1	7.8	13.8	15.5
Hispanic	4.0	1.5	2.3	39.6	29.4	27.1	27.3	31.2	28.6	22.1	30.0	32.5	7.0	7.8	9.5
% of population under age 15[b]															
White	--	6.2	9.9	--	65.0	58.4	--	21.0	21.3	--	6.9	8.9	--	0.9	1.5
Black	--	0.7	1.6	--	16.7	21.0	--	27.0	24.3	--	40.5	35.0	--	15.1	18.1
Hispanic	--	1.2	1.8	--	27.6	24.9	--	30.8	28.3	--	31.6	34.5	--	8.8	10.6

[a] "White" and "Black" groups comprise Hispanics and non-Hispanics, since the 1970 census did not tabulate race by Hispanicity.

[b] The 1970 census did not tabulate race or Hispanicity by age, and the 1980 census only tabulated race by Hispanicity by age for age categories 0-4, 5-14, 15-59, and 60+.

Source: Author's calculations from U.S. census data (U.S. Bureau of the Census 1972, 1982a, 1992a).

TABLE 2

Childhood Expectancy in 5 Neighborhood Types, by Neighborhood Status at Birth
PSID Children, 1990 to 1993

Neighborhood status at birth[a]	Childhood expectancy (% of age 0 to 18) in:														
	"Nonpoor"									"Poor"					
	Affluent (< 3% poverty)			Low poverty (3 to 10%)			Moderate poverty (10% to 20%)			High poverty (20% to 40%)			Extreme poverty (> 40%)		
	White	Black	Hispanic	White	Black	Hispanic	White	Black	Hispanic	White	Black	Hispanic	White	Black	Hispanic
All	31.1	6.7	2.6	35.0	11.3	31.8	19.6	19.2	29.6	10.8	29.5	28.4	3.5	33.4	7.6
Nonpoor[b]	36.0	17.4	--	39.8	20.5	--	20.2	33.8	--	3.9	22.9	--	0.0	5.4	--
Poor[c]	6.6	2.1	--	11.5	7.0	--	11.1	10.7	--	53.4	33.8	--	17.5	46.5	--

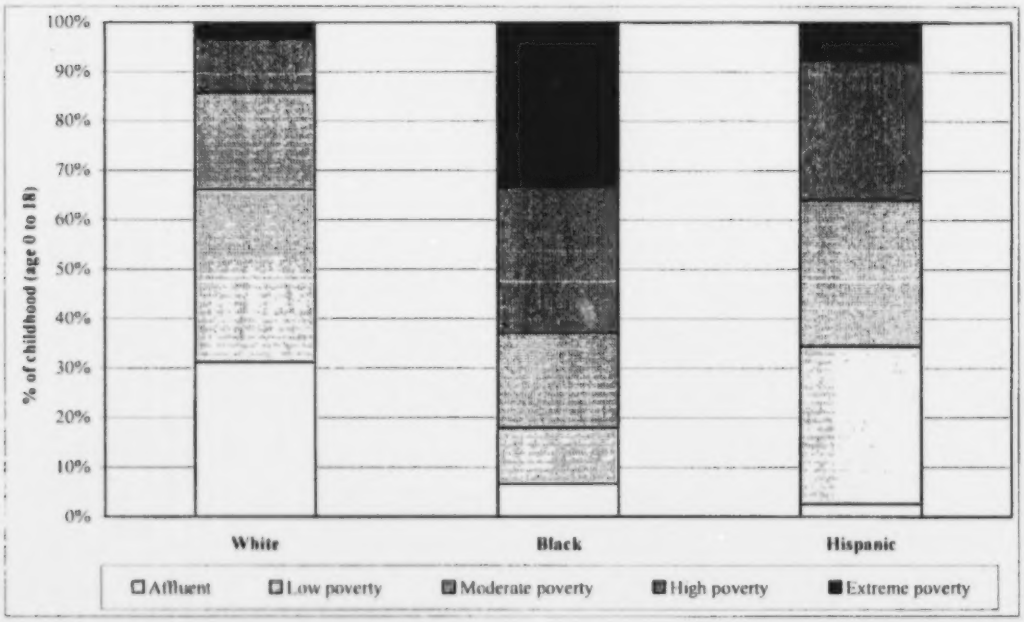
Note: "White," "Black," and "Hispanic" refer to children who were identified on the PSID as non-Hispanic Whites, non-Hispanic Black, and Hispanic, respectively.

[a] Neighborhood status at birth not available for Hispanic children.

[b] 90.7 percent of White children and 33.6 percent of Black children born in neighborhoods with less than 20% poverty.

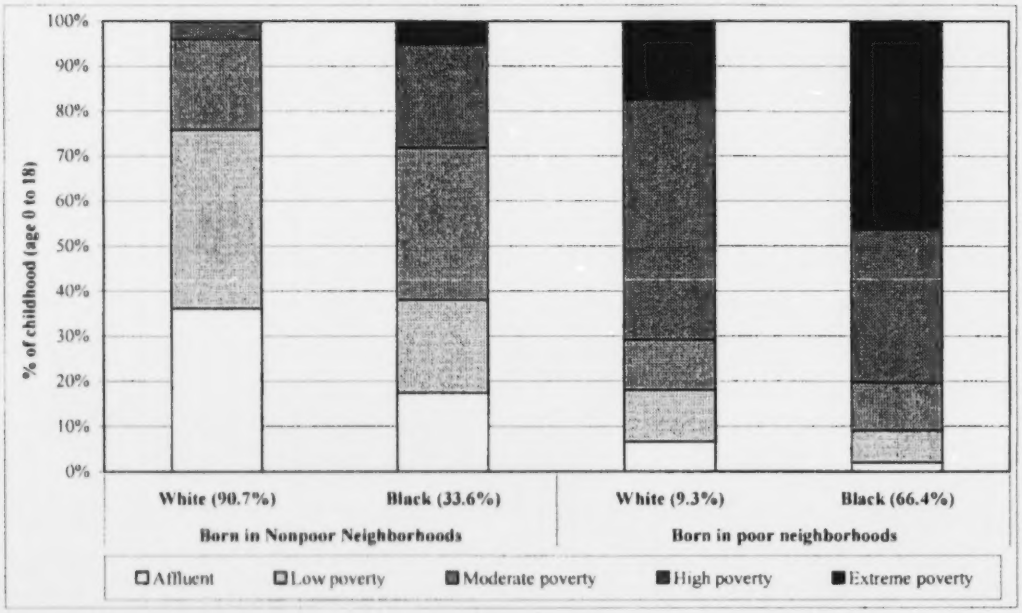
[c] 9.3 percent of White children and 66.4 percent of Black children born in neighborhoods with greater than 20% poverty.

FIGURE 2
Childhood Expectancy in 5 Neighborhood Types
PSID Children, 1990 to 1993



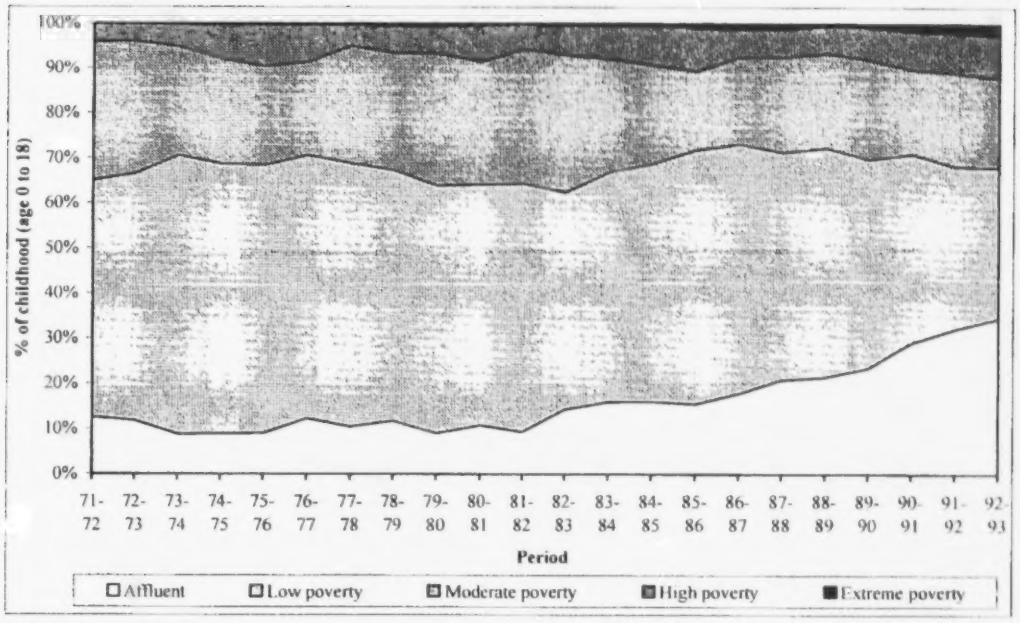
Note : Figures from synthetic birth cohort estimated for the 1990 to 1993 period.

FIGURE 3
Childhood Expectancy in 5 Neighborhood Types
PSID Children, 1990 to 1993



Note : Figures from synthetic birth cohort estimated for the 1990 to 1993 period.

FIGURE 4
Childhood Expectancy in 5 Neighborhood Types
White PSID Children, 1971 to 1993



Note : Figures are 3-year moving averages for synthetic birth cohorts estimated from multi-state life tables.

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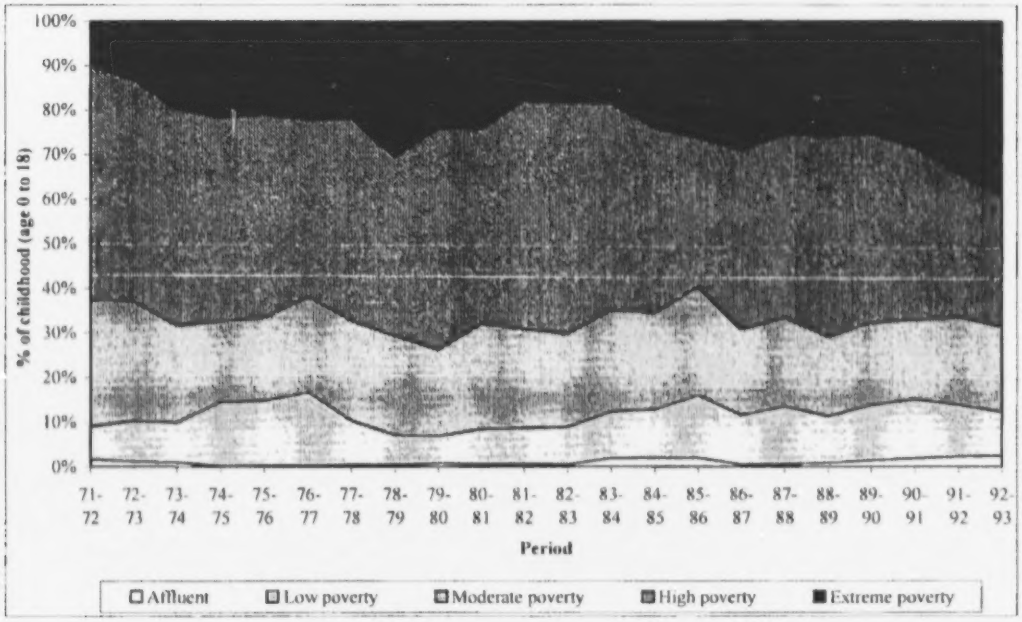
FIGURE 5
Childhood Expectancy in 5 Neighborhood Types
Black PSID Children, 1971 to 1993



Note : Figures are 3-year moving averages for synthetic birth cohorts estimated from multi-state life tables.

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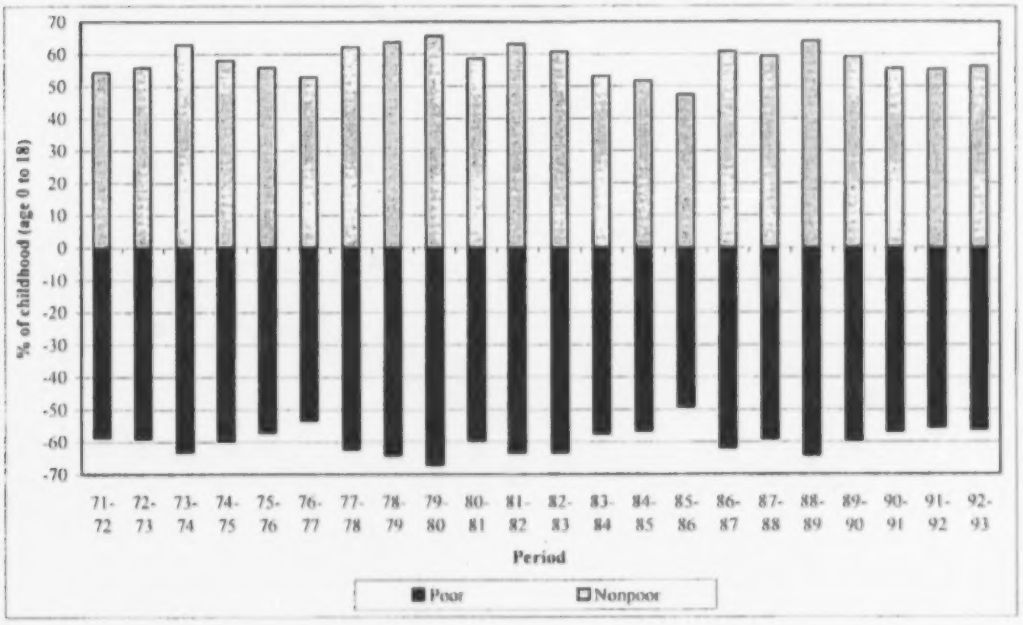
FIGURE 6
Racial Gap (White-Black) in Childhood Expectancy in Poor and Nonpoor Neighborhoods
PSID Children, 1971 to 1993



Note : Figures are 3-year moving averages for synthetic birth cohorts estimated from multi-state life tables.

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